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NEW USSR LIVER PREPARATION ANTIANEMIN

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[Comment: In addition to the applications mentioned below, the new Soviet liver preparation antianemin has been recommended for use in the treatment of disturbances of the blood formation mechanism that arise in connection with radiation sickness (cf. A. V. Kozlova, "Radiation Sickness," Vestnik Rentgenologii i Radiologii, No 4, 1954, pp 38-43). In view of the emphasis placed on the activity of cobalt in the discussion below, one may conclude that various drugs containing cobalt, in combination with liver preparations or without them, will presumably be investigated in the USSR, or are being investigated there at present, with the view of using them for the treatment of disturbances of hemopoiesis. The following report is based on a contribution from the Central Institute of Hematology and Blood Transfusion.]

The liver preparation antianemin, which is being proposed by us for the treatment of anemia, has been prepared by the Central Scientific Research Laboratory of Organotherapeutic Preparations ["Organopreparaty"] attached to the Meat Combine [not further identified] and tested by us from the standpoint of its hemopoietic activity. To establish whether or not preparations of this type are therapeutically effective, it is necessary to demonstrate that they have hemopoietic activity. Hitherto no method has been available which made possible a reliable qualitative and quantitative determination of the activity of liver preparations. Singer's test, a reticulocytic reaction used for the determination of hemopoietic substances in gastric juice, does not yield any quantitative data. Furthermore, the Singer test is not precise, because reticulocytosis cannot serve as a reliable indication by reason of its instability in the experimental animals used (rats).

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The Cytological Laboratory [of the Central Scientific Research Institute of Hematology and Blood Transfusion] has developed a method of hemocultures which enables us to establish qualitative and quantitative differences in the activity of hemopoietic substances contained in various liver preparations. With the aid of this method of tissue culture, more than 200 liver preparations obtained by procedures which differed in various details were tested under laboratory conditions.

The results of the laboratory investigations showed that the preparation which has been named by us antianemin is more active than campolon or the standard grade of liver extract.

The advantages of antianemin in comparison with the available liver preparations are the simplicity of the method of preparation and its relatively low cost.

The liver preparation antianemin, into the composition of which we introduced cobalt, has been prepared by the Central Scientific Research Laboratory of Organotherapeutic Preparations in forms suitable for intramuscular administration and for peroral use. After antianemin had been tested for effectiveness and subjected to various biological tests, such as checks for sterility, tests for absence of toxicity, and determination of the effect on blood pressure, it was referred to the Hematological Clinic of the Institute [Central Institute of Hematology and Blood Transfusion].

Investigations dealing with the effect of cobalt on hemopoiesis were originally published in 1929. After being administered in small doses, cobalt exerts a stimulating effect on the bone marrow and for that reason contributes to producing a rise in the level of hemoglobin, erythrocytes, and reticulocytes in the peripheral blood. In experiments carried out on rate, it was established that cobalt produces polyglobulism. When cobalt is introduced into the organism, no reduction of the oxidative capacity of the blood takes place and no effect on the formation of methemoglobin in the blood is observed. Cobalt is easily eliminated from the body. According to the data of Berzin and Koval'skiy, a dose of cobalt amounting to one gram per 100 kilograms of weight of the body of a calf does not produce any deleterious effect. Cobalt is widely used in the therapy of some nervous and infectious diseases and also in the treatment of anemias of various origin.

Analysis of the ash of crystalline vitamin B_{12} that has been isolated from liver indicates that this ash, in addition to phosphorus, contains a large amount of cobalt, i.e., close to 4 percent. Vitamin B_{12}, in addition to exerting an active effect on erythropoiesis in pernicious anemia and other forms of anemia, is also a growth factor.

At the hematological clinic, antianemin containing cobalt was administered to 38 patients. Twenty-seven of these patients received the drug parenterally. Nineteen of the patients treated had the Addison-Biermer disease, while eight had other forms of anemia (sprue, chloranemia, anemia following resection of the stomach, hemolytic anemia, and macrocytic anemia).

In treating the 19 patients who had the Addison-Biermer disease, 2-4 grams of antianemin were administered per day. The total quantity administered during the course of treatment amounted to 44-100 grams. An increase in the quantity of hemoglobin amounting from 21-44 percent to 61-77 percent and comprising one percent per day was observed, while the number of erythrocytes increased from 930,000 to 3,500,000-4,370,000. There was also an increase in the number of leukocytes and thrombocytes. Immature forms of granulocytes disappeared, and the number of lymphocytes approached normal. No recurrence of the disease was observed in 16 patients, while three patients had recurrences within 7, 12, and 14 months, respectively, after completion of the course of treatment.

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During treatment with antianemin, toxic phenomena or infiltrations at the sites of injection were not observed. When 600-1,875 grams of antianemin were administered perorally during 13-47 days for the treatment of the forms of anemia mentioned above, an increase in the quantity of hemoglobin and in the number of erythrocytes was observed.

The average daily increase by one percent of the quantity of hemoglobin, which has been achieved by administering antianemin containing cobalt, is higher than that attained with the use of other liver preparations. Antianemin must be assumed to be a more effective preparation than campolon, because its application results in an earlier abatement of the symptoms of anemia.

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